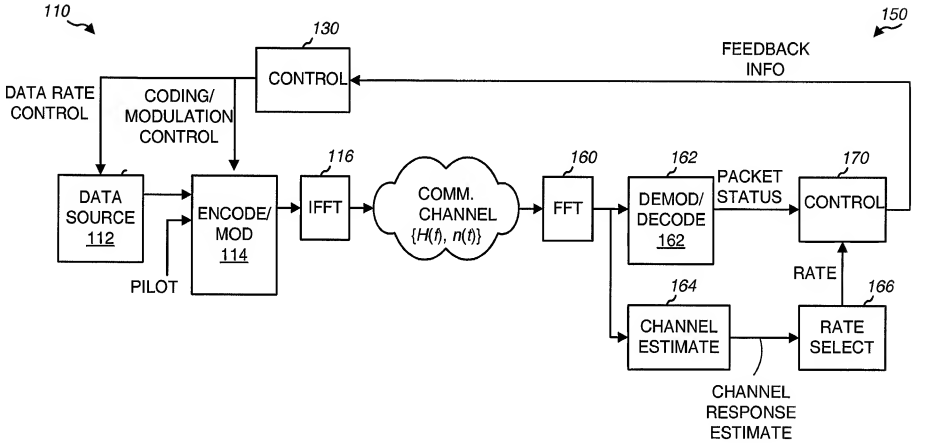
110
130
150
FEEDBACK INFO
CONTROL
DATA RATE CONTROL
CODING/ MODULATION CONTROL
116
160
162
170
DATA SOURCE 112
ENCODE/ MOD 114
IFFT
COMM. CHANNEL {H(f), n(f)}
FFT
DEMOD/ DECODE 162
PACKET STATUS
CONTROL
PILOT
RATE
164
166
CHANNEL ESTIMATE
RATE SELECT
CHANNEL RESPONSE ESTIMATE

FIG. 1A

20020207.SE8980OT

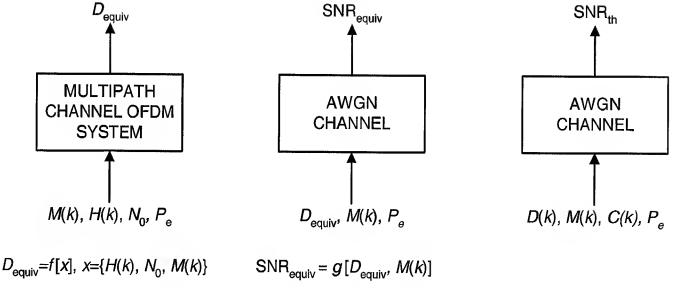

FIG. 1B

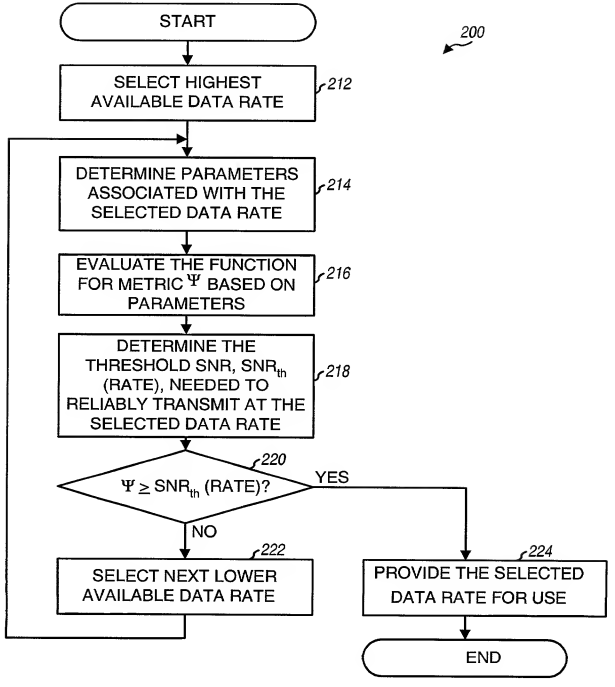
START
200
SELECT HIGHEST AVAILABLE DATA RATE
212
DETERMINE PARAMETERS ASSOCIATED WITH THE SELECTED DATA RATE
214
EVALUATE THE FUNCTION FOR METRIC Ψ BASED ON PARAMETERS
216
DETERMINE THE THRESHOLD SNR, SNR$_{th}$ (RATE), NEEDED TO RELIABLY TRANSMIT AT THE SELECTED DATA RATE
218
220
Ψ ≥ SNR$_{th}$ (RATE)?
YES
NO
222
SELECT NEXT LOWER AVAILABLE DATA RATE
224
PROVIDE THE SELECTED DATA RATE FOR USE
END

FIG. 2

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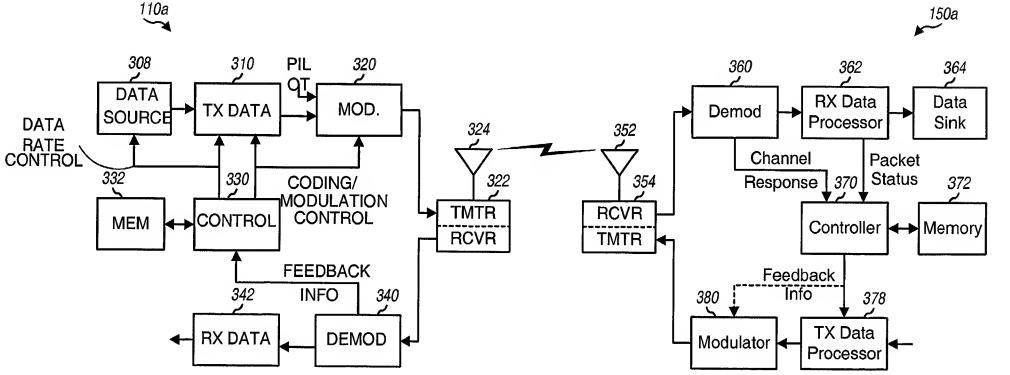

FIG. 3

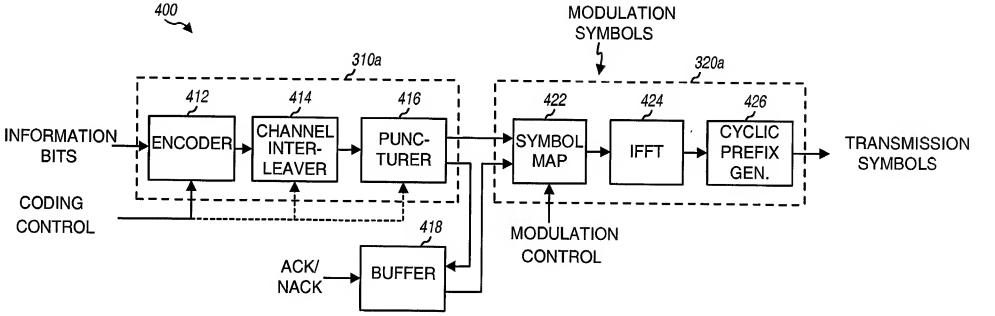
400
MODULATION SYMBOLS
310a
320a
412
414
416
422
424
426
INFORMATION BITS
ENCODER
CHANNEL INTER-LEAVER
PUNC-TURER
SYMBOL MAP
IFFT
CYCLIC PREFIX GEN.
TRANSMISSION SYMBOLS
CODING CONTROL
418
ACK/ NACK
BUFFER
MODULATION CONTROL

FIG. 4

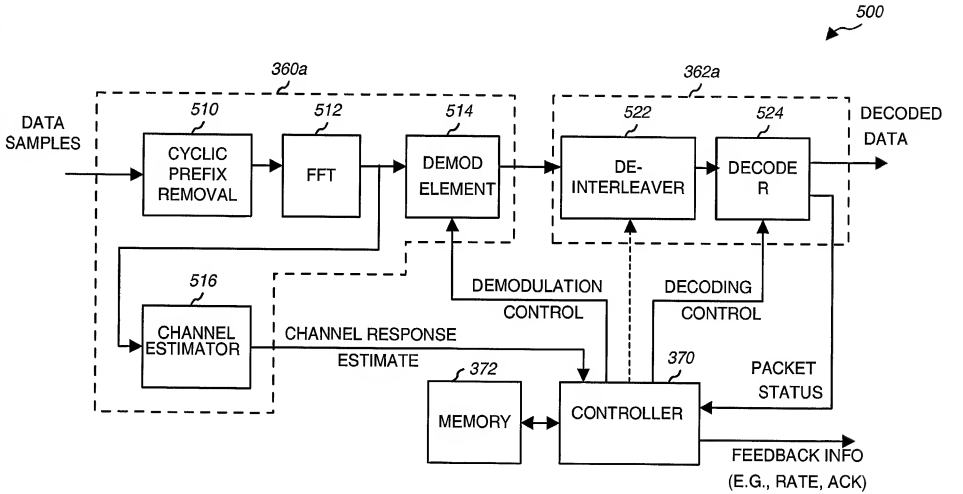
500
360a
362a
DATA SAMPLES
510
CYCLIC PREFIX REMOVAL
512
FFT
514
DEMOD ELEMENT
522
DE-INTERLEAVER
524
DECODE R
DECODED DATA
516
CHANNEL ESTIMATOR
DEMODULATION CONTROL
DECODING CONTROL
CHANNEL RESPONSE ESTIMATE
372
MEMORY
370
CONTROLLER
PACKET STATUS
FEEDBACK INFO (E.G., RATE, ACK)

FIG. 5

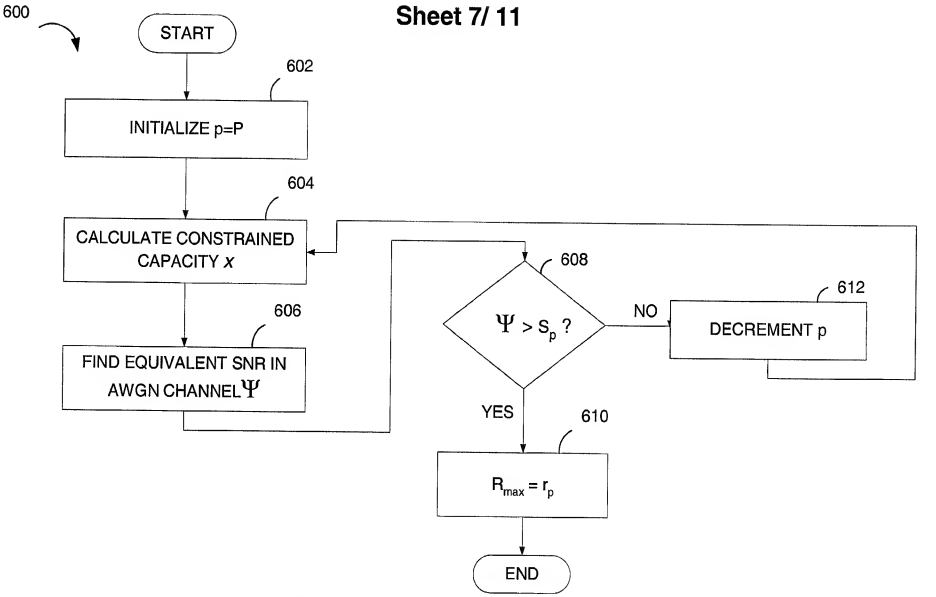
600
START
602
INITIALIZE p=P
604
CALCULATE CONSTRAINED CAPACITY x
606
FIND EQUIVALENT SNR IN AWGN CHANNEL Ψ
608
Ψ > S_p ?
NO
612
DECREMENT p
YES
610
R_max = r_p
END

FIG. 6

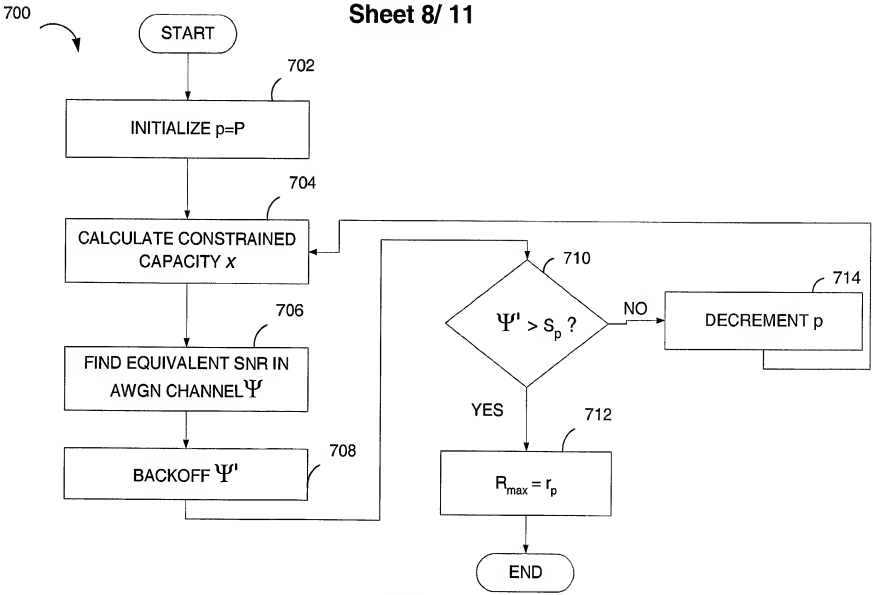
700
START
702
INITIALIZE p=P
704
CALCULATE CONSTRAINED CAPACITY x
706
FIND EQUIVALENT SNR IN AWGN CHANNEL Ψ
708
BACKOFF Ψ'
710
Ψ' > S_p ?
NO
714
DECREMENT p
YES
712
R_max = r_p
END

FIG. 7A

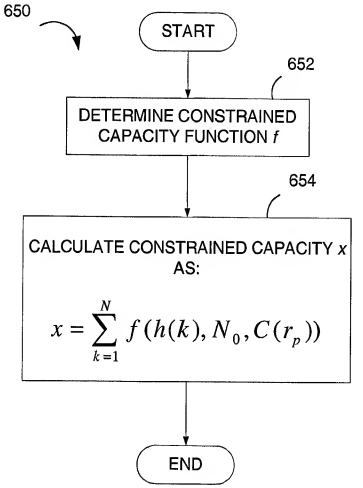
650
START
652
DETERMINE CONSTRAINED CAPACITY FUNCTION f
654
CALCULATE CONSTRAINED CAPACITY x AS:
$x = \sum_{k=1}^{N} f(h(k), N_0, C(r_p))$
END

FIG. 7B

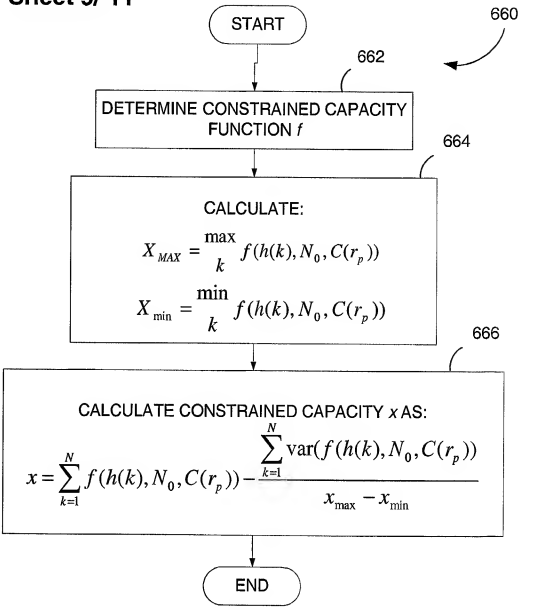
START
660
662
DETERMINE CONSTRAINED CAPACITY FUNCTION f
664
CALCULATE:
$X_{MAX} = \max_k f(h(k), N_0, C(r_p))$
$X_{\min} = \min_k f(h(k), N_0, C(r_p))$
666
CALCULATE CONSTRAINED CAPACITY x AS:
$x = \sum_{k=1}^{N} f(h(k), N_0, C(r_p)) - \frac{\sum_{k=1}^{N} \mathrm{var}(f(h(k), N_0, C(r_p))}{x_{\max} - x_{\min}}$
END

FIG. 7C

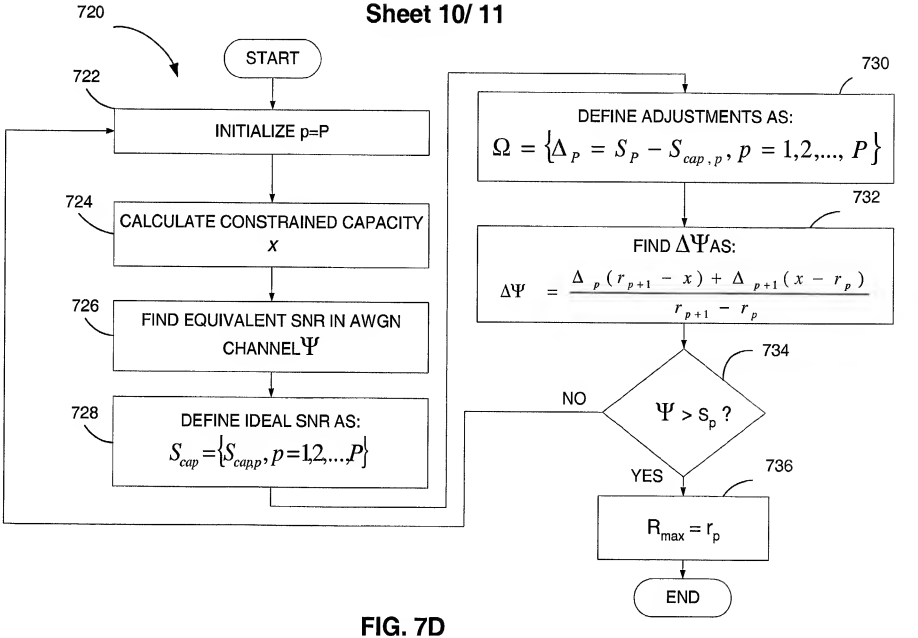
720
START
722
INITIALIZE p=P
724
CALCULATE CONSTRAINED CAPACITY
x
726
FIND EQUIVALENT SNR IN AWGN CHANNEL Ψ
728
DEFINE IDEAL SNR AS:
$S_{cap}=\{S_{capp}, p=1,2,...,P\}$
730
DEFINE ADJUSTMENTS AS:
$\Omega = \{\Delta_P = S_P - S_{cap,p}, p = 1,2,..., P\}$
732
FIND ΔΨ AS:
$\Delta\Psi = \frac{\Delta_p (r_{p+1} - x) + \Delta_{p+1}(x - r_p)}{r_{p+1} - r_p}$
734
Ψ > S_p ?
NO
YES
736
R_max = r_p
END

FIG. 7D

20820'82898001

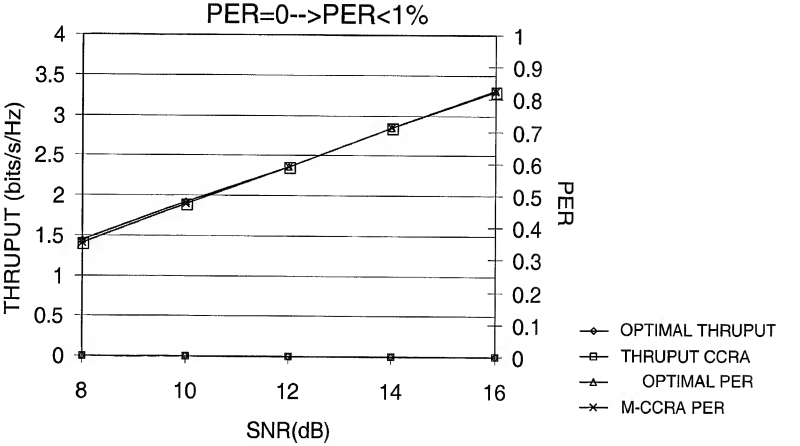

FIG. 8